EAST POPLAR AVENUE UNDERPASS
(Bridge No. 35C0091)
East Poplar Avenue at North Claremont Street
San Mateo
San Mateo County
California

HAER No. CA-2274

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Pacific West Region
1111 Jackson Street, Suite 700
Oakland, CA 94607

HISTORIC AMERICAN ENGINEERING RECORD

EAST POPLAR AVENUE UNDERPASS
(Bridge No. 35C0091)

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Location: The East Poplar Avenue Underpass (Bridge No. 35C0091) is located southwest of intersection of East Poplar Avenue and North Claremont Street in the City of San Mateo, County of San Mateo, California.

USGS San Mateo Quadrangle 7.5 minute, 1997
UTM Coordinates: 10.4158748.559106

Date of Construction: 1903; sacrificial beams added 2006

Engineer: American Bridge Company, New York

Builder: Southern Pacific Railroad

Present Owner: Peninsula Corridor Joint Powers Board (PCJPB)
1250 San Carlos Avenue
San Carlos, California 94070

Present Use: Railroad Bridge

Significance: The East Poplar Avenue Bridge is part of the historic property identified as the "San Mateo 1903 Underpasses" that was determined eligible for listing in the National Register of Historic Places in 2002. The bridge, along with three others, is significant at the local level for its association with the development of northern San Mateo, with the growth of grade separation construction during the early twentieth century, and as an example of an important early phase of development within the evolution of underpass design.

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Date: June 2010

I. DESCRIPTION OF EAST POPLAR AVENUE BRIDGE

The East Poplar Avenue Bridge is one of four similar railroad bridges located along three-tenths of a mile of track over four parallel streets in the City of San Mateo (from north to south): East Poplar, Santa Inez, Monte Diablo, and Tilton avenues. From north to south, the underpasses have progressively lower clearance over the roads they pass, accounting for the change in elevation between Burlingame to the north and San Mateo town center to the south. The tracks are part of the main railroad line on the San Francisco Peninsula between San Francisco and San Jose and are owned by the Peninsula Corridor Joint Powers Board (PCJPB). The PCJPB operates the Caltrain commuter rail service on these tracks. The East Poplar Avenue Bridge is located between Ramona Street and North Claremont Street in a densely developed residential area of northern San Mateo with houses and apartment buildings in close proximity to the structure along tree lined streets and mature landscaping. Caltrans' bridge number for the structure is 35C0091.

The structure is a through plate girder bridge with concrete wing wall abutments. The bridge has three simply supported spans consisting of one 36' long main span and two 8' approach spans. The East Poplar Avenue Bridge is slightly skewed (-12 degrees) to the roadway alignment. East Poplar Avenue is the most northerly of the group of four bridges and the tallest of them with a clearance height of 13' to the roadway it spans. The bridge's main span has three steel through-plate girders parallel to the tracks. The bridge deck and girder rest on riveted steel support bents with cross bracing. Approach spans consist of closely spaced small steel I-beams with timber deck planks on top to retain and support the ballast. Retaining the ballast on each bridge are wood walls topped with pipe railings at either end of the girders. The bridge superstructure supports two ballasted railroad tracks, primarily used by Caltrain passenger trains with some Union Pacific Railroad (UPRR) freight trains. The bridge date of construction is stamped on the southwest side along with a small cast iron plaque indicating it was constructed by the American Bridge Company of New York in 1903. The original concrete abutments have been added to over time, and single cast iron pipe runs along the outside of the western girder on the bridge. The PCJPB installed sacrificial beams on either side of the bridge in 2006 to prevent tall vehicles from hitting and damaging the underpass. The sacrificial beams are steel tubes that are 14" square in cross section. They run horizontally along the outside of the bridge's plate girders approximately one foot from the girders and they rest on footings attached to the top of the concrete wall abutments.

II. HISTORICAL INFORMATION

[The following historical narrative is based on, and excerpted from, JRP Historical Consulting Services, "Inventory and Evaluation of Historic Resources Caltrain Electrification Project, San Francisco to Gilroy (MP 0.0 to 77.4)" (2001)), JRP Historical Consulting, "Inventory and Evaluation of Historic Resources, Caltrain Five Bridges Project," (2006), and JRP Historical Consulting, "Finding of Adverse Effect: Caltrain San Mateo Bridges Replacement Project, Caltrain MP 17.20, 17.24, 17.45, and 17.53, In the City of San Mateo, San Mateo County, California," (2006). Citations from the reports are provided in footnotes and references are provided in Section III.]

The East Poplar Avenue Bridge is one of four underpasses in San Mateo situated on the former Southern Pacific Railroad route between San Francisco and San Jose. The underpasses are historically significant for their association with the development of northern San Mateo and with the growth of grade separation construction during the early twentieth century. The structures embody distinctive engineering characteristics of type, period, and method of construction that are representative of features once common to railroad underpasses, yet are illustrative of an important phase of development within the evolution of underpass design. Southern Pacific built the East Poplar Avenue bridge during the company's phase of upgrades and development during the early twentieth century.

Construction and Development of the Southern Pacific Railroad along the San Francisco Peninsula

The history of the railroad on the San Francisco Peninsula coincides with creation of the State of California in 1850 and the transportation difficulties that the new state faced. San Jose, the first state capital, was only about forty miles south of San Francisco, which was rapidly growing in response to the Gold Rush and its aftermath. Although the Spanish-era El Camino Real roadway provided some north-south connections along the peninsula, travel between the two cities was a time-consuming and arduous journey via mostly rough and unreliable roads. Railroad lines were well established in the eastern United States by this time, but the transcontinental link was almost 20 years away and California's early railroad investors had many obstacles to contend with, not the least of which were obtaining the necessary funding and kindling public support. Also a problem was the geography of the San Francisco Peninsula itself. This narrow neck of land alternately presented craggy inlets, steep gradients, and boggy tidelands between San Francisco

and San Jose that would prove to be a challenge to the railroad industry into the twentieth century.

The first three attempts to connect San Francisco and San Jose by rail failed before construction could begin. The Pacific and Atlantic Railroad Company, formed in September 1851 by a group of San Francisco and San Jose investors, made the first two efforts. The group failed to raise sufficient funds through the sale of stock to begin construction, folded in 1853, and reorganized later the same year only to face waning interest in the railroad venture caused by a financial slump and the move of the state capital, first to Vallejo and then Sacramento. In 1857, San Francisco capitalists formed the San Francisco – San Jose Railroad Company, but the failed legacy of the two earlier attempts, as well as criticism from San Francisco newspapers that favored steamship lines, caused the company to disband. Finally in 1860, with an upturn in the economy fueled by the silver boom in Nevada, the San Francisco – San Jose Railroad Company (SF-SJRR) was revived. This time the company had political support from Congressman Timothy Phelps and the financial support from the San Francisco business community, two factors that led to favorable reporting from San Francisco's influential newspaper, the *California Alta*. Voters in San Francisco, San Mateo, and Santa Clara counties approved bond measures used to purchase $100,000 worth of railroad stock. This strong foundation allowed the company to finally succeed in establishing a rail link between San Francisco and San Jose, which passed through what became the City of San Mateo.[1]

W.J.L. Moulton, superintendent of construction for SF-SJRR, directed crews to begin work on the single line railroad starting at San Francisquito Creek (now in Palo Alto), which forms the boundary between San Mateo and Santa Clara counties, in May 1861. Construction of the line was slowed by both the Civil War, which hindered the delivery of construction materials from the eastern states, and by heavy storms and flooding in the winter of 1861-62. The route was sufficiently built by October 1862 when Governor Leland Stanford officiated at celebrations for completion of the railroad between San Francisco and Mayfield (now the California Avenue Station in Palo Alto), including tracks through San Mateo. Regular service on this segment began in January 1863.[2]

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[1] Alan Hynding, *From Frontier to Suburb: The Story of the San Mateo Peninsula* (Belmont, CA: Star Publishing Company, 1982), 62.

[2] John R. Signor, *Southern Pacific's Coast Line* (Wilton: Signature Press, 1994), 3; Louis Richard Miller, "The History of the San Francisco and San Jose Railroad," Master's thesis, UC Berkeley, 1947, 64-65; Hynding, *From Frontier to Suburb*, 62.

The SF-SJRR completed the rail line from San Francisco to San Jose and began services on the whole route in 1864. The Southern Pacific Railroad, which incorporated in 1865, acquired the SF-SJRR in 1868 and consolidated the separate railroad under the Southern Pacific name two years later.[3] Regular daily passenger service in the initial years of operation on the peninsula consisted of a morning train and two afternoon round trips between San Francisco and San Jose. Other than the general alignment, this single-track railroad had little in common with the modern system, which was developed over the years by successive upgrades and changes by Southern Pacific (and more recently by Caltrain) in response to periods of substantially increased traffic. The original route that was constructed in the 1860s differed from the modern alignment in one major way – it followed a longer route that left San Francisco and headed southwest to Valencia Street and Bernal Heights, past the San Miguel Hills and over the western shoulder of San Bruno Mountain before turning southeast and running along Colma Creek to San Bruno. This section was called the Ocean View line, the Valencia Street line, or "the Cemeteries" for the large number of burial grounds it passed near Colma. Helper engines were needed on the most mountainous portions of this route that climbed to almost 300 feet above sea level in a distance of about five miles. As discussed below, Southern Pacific completed the construction of a new route along the coast and flat lands on the east side of the peninsula in 1907 to replace the Ocean View line. This was dubbed the Bayshore Cutoff.[4]

During the period from 1870 through 1900, the peninsula route was the only freight and long-distance passenger line that served San Francisco. Although streetcar companies in both San Francisco and San Jose vied for local customers, Southern Pacific was the only company that could offer transcontinental land route service into the heart of San Francisco. The connection between San Francisco and the southern Bay Area also encouraged suburban development and people started to commute to work by rail. Once out of San Francisco, many stations, like the one in San Mateo during the late nineteenth century, were merely stops in the rural landscape that served communities that were not much more than villages. In the last quarter of the nineteenth century, much of the land in eastern San Mateo and Santa Clara counties was still held in large tracts by wealthy businessmen, industrialists, and other California capitalists. Two notable landowners were Charles Polhemus, entrepreneur and SF-SJRR director who laid out and plotted the town of San Mateo, and San Francisco merchant William D. M. Howard, who

[3] Donovan L. Hofsommer, *The Southern Pacific, 1901-1985* (College Station, TX: Texas A&M University Press, 1986), 4; Signor, *Southern Pacific's Coast Line,* 5-7.
[4] "S.P. Ocean View Line," *The Western Railroader* 41 (September 1978): 2; "The Bay Shore and Dumbarton Cut-Offs of the Southern Pacific," *The Railroad Gazette* 42 (March 15, 1907): 328-329; Fred A. Stindt, "Peninsula Service: A Story of the Southern Pacific Commuter Trains," *The Western Railroader* 20 (1957): 21.

had purchased part of Rancho San Mateo in 1849. Howard's family was the first to convert a Mexican-era rancho into a country estate along the peninsula. Through the first decades of the 1900s, the peninsula remained relatively undeveloped in terms of industry and commerce.[5]

From the 1870s through the end of the century, control of peninsula rail travel allowed the Southern Pacific's leaders to concentrate their efforts to acquire other rail companies and to construct new lines elsewhere in the state and in the West. The company became the dominate railroad in California and the West, controlling well over 8,000 route miles throughout the western United States and ranging from Portland in the northwest to New Orleans in the south. One of the company's biggest projects during the 1870s was the construction of a route down the center of the San Joaquin Valley that then crossed the Tehachapi Mountains, and finally led through the San Fernando tunnel into the Los Angeles basin. This access to southern California was crucial for the development of the Southern Pacific system, and the company did not add another major north-south route through the state until it completed its Coast Line between San Francisco and Los Angeles in 1901. The Southern Pacific connected San Francisco to Omaha, Nebraska via Ogden, Utah by combining lines with the UPRR to form the cross continental Overland Route. The company's holdings included vast operations throughout California, as well as a steamship company that linked New Orleans with New York and other points in the eastern United States. These varied and wide-spread holdings gave the company influence over economic development throughout the state and certainly along the peninsula and the southern San Francisco Bay Area.[6]

Early San Mateo Residential Development

The town of San Mateo began in the 1860s and evolved in response to railroad spurred development along the peninsula in subsequent decades and in the early twentieth century. Charles Polhemus laid out and plotted the town of San Mateo in 1862. Polhemus purchased parcels along strategic points of the Peninsula railroad and carefully planned for the railroad to pass through the eastern portion of his property. The town limits extended from the San Mateo Creek on the north to present-day Fifth Avenue on the south, and west to east from South

[5] Frank Stanger, *South From San Francisco* (San Mateo County Historical Association, 1963), 146-60; Joseph A. Blum, "South San Francisco: The Making of an Industrial City," *California History* 63 (Spring 1984): 114-134; "Official Map of San Mateo County," compiled by J. V. Neuman, County Surveyor (1909); "Official Map of San Mateo County," compiled by George V. Kneese, County Surveyor (1927); Donald P. Ringler, *San Mateo, USA: the Golden Years.* (San Mateo: San Mateo Bicentennial Committee, 1975), 9; Mitchell Postel, *San Mateo: A Centennial History* (San Francisco: Scottwall Associates, Publishers, 1994), 23, 28, 41, 47.
[6] Hofsommer, *The Southern Pacific, 1901-1985*, 4-8; Signor, *Southern Pacific's Coast Line*, 11-12.

Ellsworth Avenue (formerly A Street) to Delaware Street (formerly D Street), leaving the northern portion of town, where the East Poplar Avenue bridge would be built, initially undeveloped. Polhemus put 176 lots on the market before the railroad was completed, and by 1865 had sold all but forty parcels. The commercial district for San Mateo was now focused towards the railroad tracks and away from El Camino Real, the peninsula's main north-south roadway. The downtown area of San Mateo grew slowly but steadily through the years, and the railroad offered San Mateo businesses, ranchers, and farmers an affordable means to ship their products to market in San Francisco. It also encouraged residential settlement surrounding the commercial district.[7] Railroad access made San Mateo and its surrounding environs attractive to wealthy San Franciscans who purchased large tracts of land for summer and weekend estates. Like most of the land surrounding the town of San Mateo, the area north of San Mateo Creek remained undeveloped and was in the possession of a handful of property owners until the 1890s. Until that time, attempts to expand San Mateo's borders were unsuccessful, as most of the families refused to subdivide their land.[8]

William D. M. Howard's estate El Cerrito was situated on much of the land to the north of San Mateo Creek and the developing town of San Mateo. This large estate contained orchards and vast gardens. In 1889, the merchant's son, William H. Howard, subdivided a portion of the family estate to create a subdivision called the Western Addition. The newly created subdivision originally stretched southeast from Poplar Avenue towards D Street (currently Delaware Street), past San Mateo Creek, and west towards Camino Real (County Road) and was bisected by the railroad. This included the area where the East Poplar Avenue and other San Mateo underpasses were subsequently built. The real estate firm Briggs, Fergusson and Company aggressively advertised the attributes of both San Mateo and the subdivision, contributing to its success.[9]

The success of the Western Addition changed San Mateo, which until that time had been largely comprised of wealthy residents with estates and their staff. The smaller, more economical town lots of the new subdivision attracted a different kind of resident. San Francisco's businessmen, clerks, and shop workers commuted to work from San Mateo and shared neighborhoods with the gardeners, bakers, and other workers employed by the city and estates. Of the thirty-three Western Addition blocks, divided by streets laid in an irregular grid, twenty-three of them were

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[7] Postel, *San Mateo: A Centennial History*, 40; Signor, *Southern Pacific's Coast Line*, 28 and 39.
[8] Donald P. Ringler, *San Mateo, USA: the Golden Years.* (San Mateo: San Mateo Bicentennial Committee, 1975), 9; Postel, *San Mateo: A Centennial History,* 23, 28, 41, 47, 98-99.
[9] Postel, *San Mateo: A Centennial History*, 98-99; Map of the Subdivision in Blocks of the Western Addition of the Town of San Mateo (1889).

quickly divided into regular small city lots. The remaining blocks were later divided, some of which were larger and contained irregularly shaped lots. By the early 1890s, lots along the east side of the railroad at Tilton Avenue were being developed. By the turn of the twentieth century, the parcels nearest the railroad tracks were more developed than those located further west.[10] Southern Pacific's San Mateo station plat and property ownership maps reveal that the railroad purchased additional right-of-way in 1901 and 1902 from roughly 15 property owners on the east side of the tracks between Bellevue Avenue (north of East Poplar Avenue) south to Monte Diablo Avenue. This was in anticipation of impending upgrades to the rail line through San Mateo. As discussed below, construction the East Poplar Avenue Bridge and other San Mateo underpasses in 1903 helped facilitate the development of the Western Addition and northern San Mateo.[11]

San Mateo's population grew substantially during the early twentieth century with the modernization and completion of double tracks down the peninsula in the initial years of the twentieth century, along with the implementation of faster, more frequent train service that spurred suburban development along the line. Many San Francisco residents sought new homes within a reasonable commute to the City of San Francisco after the 1906 earthquake. While San Mateo suffered some damage from the quake, it was minor in comparison with the damage experienced in San Francisco. Within four years of the disaster, 10,000 people immigrated to San Mateo County; a pattern repeated throughout the San Francisco Bay Area. Some new towns formed in unincorporated areas along the peninsula, while existing communities also grew with the new inhabitants who required houses and services. This trend continued into the 1910s and 1920s and led to the emergence of new subdivisions that developed on former larger estates. While many San Mateo residents commuted to San Francisco and other peninsula cities, others worked on nearby farms and dairies. During the 1910s and 1920s, San Mateo became a predominantly middle class commuter suburb for affluent professionals such as doctors, attorneys, and bankers, though the neighborhood along the railroad tracks remained largely inhabited by working class individuals and families.[12]

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[10] Map of the Subdivision in Blocks of the Western Addition of the Town of San Mateo (1889); Sanborn Maps, *San Mateo*, (1891 and 1897), 5; Sanborn Fire Insurance Map, *San Mateo, California*, (1891-1901).
[11] Postel, *San Mateo*, 98-99.
[12] Hynding, *From Frontier to Suburb*, 188–190, 209; Stanger, *History of San Mateo County,* 114.

Southern Pacific's Early Twentieth Century Development and Construction of the San Mateo Underpasses

Edward Henry Harriman gained control of Southern Pacific in 1901 and ushered in a new phase of development for the company. Harriman was from New York and had quit school to work in a Wall Street brokerage at the age of fourteen. He rose through the ranks of the brokerage fast enough to buy himself a seat on the New York Stock Exchange by the age of 22 in 1870. His marriage, in 1879, to the daughter of the president of the Ogdensburg & Lake Champlain Railroad introduced Harriman to railroad ownership and he soon turned his assertive business style to that industry. By 1887 he was vice president of the Illinois Central Railroad and ten years later he was a director of the Union Pacific Railroad, one of Southern Pacific's toughest competitors. When the last of Southern Pacific's founders, Collis P. Huntington, died in 1900, Harriman immediately made a bid for the railroad stock held by his estate. It took the better part of a year to convince the various shareholders and associates to sell, but by March 1901 Harriman's Union Pacific had acquired 38 percent of Southern Pacific, a figure that would later rise to 46 percent. Almost immediately Harriman instituted improvements to the Southern Pacific system, including changes to the line between San Francisco and San Jose.[13]

Under Harriman's leadership, the Southern Pacific double tracked the line between San Francisco and San Jose and widened the right-of-way in most places to accommodate four tracks. Harriman ordered the installation of a second track between San Jose and San Bruno ahead of the construction of the largest project along the line, the Bayshore Cutoff. Thirty-nine miles of the new double track rail line was ready by late 1903, including the segment through San Mateo. In addition to constructing new track, Southern Pacific modernized the line by constructing new bridges, trestles, and other track features. Several new bridges and trestles along the peninsula route were part of this improvement program. Southern Pacific constructed the improved line in areas with increasing commercial and residential development, which necessitated building some structures that would separate the railroad from other forms of traffic. These included the installation of four nearly identical underpasses in San Mateo, including the

[13] Donald Hofsommer, "For Territorial Dominion in California and the Pacific Northwest: Edward H. Harriman and James J. Hill," *California History* (Spring 1991): 31; Hofsommer, *The Southern Pacific, 1901-1985*, 9-11. Collis Potter Huntington, the last of the "Big Four," died on August 13, 1900. Hopkins had died in 1878, followed by Crocker in 1888 and Stanford in 1893; Signor, *Southern Pacific's Coast Line,* 32-37.

structure at East Poplar Avenue, which the American Bridge Company designed for Southern Pacific in 1903.[14]

During the early twentieth century, Southern Pacific contracted with the American Bridge Company to design and build various bridges in California. The American Bridge Company was originally founded in 1870 in Chicago, Illinois, and operated as an independent company in the Midwest. In the late 1890s independent bridge companies began consolidating, and in 1900 twenty-eight of the largest steel fabricators and constructors consolidated into the American Bridge Company, taking the name of one of the contributing companies. The following year American Bridge Company became a subsidiary of United States Steel Corporation, the corporation formed by J.P. Morgan that virtually controlled the United States steel industry. American Bridge Company became the American Bridge Division of US Steel and because of its financial backing, the new company commanded a great percentage of steel bridge building projects across the country and won major contracts throughout the world, using the projects to further develop the use of steel in bridge construction. The American Bridge Company remained a subsidiary of the US Steel Corporation until 1987, when it became privately owned.

The American Bridge Company built many bridges in California, including a third of metal truss roadway bridges in the first few decades of the twentieth century and, over time, several well known roadway structures in the state, such as both the original 1927 Carquinez Strait Crossing (now demolished) and the second Carquinez Strait bridge built in 1958, the cantilever 1941 Pit River Bridge and Overhead on Interstate 5 at Lake Shasta, the Schuyler Heim Lift Bridge at the Port of Los Angeles built in 1946, and the Cold Spring Canyon Bridge in Santa Barbara built in 1963. In addition to the bridges in San Mateo, Southern Pacific also had the American Bridge Company design and build several grade separations along the Bayshore Cutoff in the southern portion of San Francisco, where Southern Pacific built multiple underpasses and overpasses in 1906 and 1907 on which local roads passed under or over the railroad. An interesting bridge Southern Pacific had American Bridge Company build that separated the railroad from other traffic was the double decker I Street Bridge over the Sacramento River in Sacramento. Constructed in 1911, it is a moveable swing bridge that carries the railroad on the lower deck and other vehicles on the roadway on the upper deck. Southern Pacific had American Bridge Company design and build other bridges in the San Francisco Bay Area, including the through

[14] See California Department of Transportation, *Historic Highway Bridges of California*, 1990, 43; American Bridge Company, "Introduction & Organization," online history at www.americanbridge.net/AboutUs/Brochure.pdf (accessed 2010).

plate girder Napa River railroad bridge, spanning Napa River, east of Soscol Avenue, in Napa in 1928 and the deck girder Willow Street Underpass in San Jose in 1935.[15]

The four through plate girder railroad bridges at the north end of San Mateo were built to carry the new double tracked rail line over East Poplar Avenue, Santa Inez Avenue, Monte Diablo Avenue, and Tilton Avenue. From north to south, the underpasses have progressively lower clearance over the roads they pass, accounting for the change in elevation between Burlingame to the north and San Mateo town center to the south. Southern Pacific constructed these underpasses as the Western Addition was developing, partially in response to a local petition to construct a grade separation. The railroad company had agreed in 1891 to build the underpass at East Poplar Avenue and to raise the tracks such that the railroad "roadbed could be pierced to permit vehicles to pass under the railroad."[16] Besides the one petition in 1891, it is unclear whether Southern Pacific received pressure from local developers or civic leaders to construct the underpasses as a way to help the northern section of San Mateo develop further. Certainly, the inclusion of these structures made the area more attractive overtime, as residents could easily traverse the railroad tracks and developable space was not taken up with long approaches that would have been necessary for at-grade crossings at any of these four roads. Southern Pacific may have been convinced to build the bridges because of the sheer size of the berm on which the railroad ran at this location. At-grade crossings at this location would have either been very steep or have required long approaches. Included in the construction of the new double track and underpasses was the random ashlar masonry wall that retained the new railroad bed and protected the extant adjacent street (North Railroad Avenue). Southern Pacific also modernized its rail line down the San Francisco Peninsula in the early 1900s in part to compete with the interurban electric railways emerging at the time. The United Railway Company began service on its own tracks between San Mateo and San Francisco in 1902. As the interurban railways drew passengers away from Southern Pacific's service, the large railroad may have been

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[15] California Department of Transportation, *Historic Highway Bridges of California*, 1990, 43; American Bridge Company, "100 Years of Innovation," online history at www.americanbridge.net/AboutUs/Brochure.pdf (accessed 2010); JRP Historical Consulting Services, "Inventory and Evaluation of Historic Resources Caltrain Electrification Project, San Francisco to Gilroy (MP 0.0 to 77.4)," prepared for Parsons Transportation Group, 2001; *Brotherhood of Locomotive Firemen and Engineers Magazine*, November 1907, 632; *Railway and Locomotive Engineering*, February 1912, 42; Matt C. Bischoff, Matthew A. Sterner, and Scott Thompson, "Historic American Engineering Record, Napa River Railroad Bridge, Spanning Napa River, east of Soscol Avenue, Napa, Napa County, CA HAER CA-322;" The Bayshore Cutoff included construction of grade separations in San Francisco in 1906 and 1907 at 22nd Street, 23rd Street, Jerrold Avenue, Quint Street, Williams Avenue, and Paul Avenue; JRP Historical Consulting Services, "Inventory and Evaluation of Historic Resources Caltrain Five Bridges Project," July 2006.

[16] Board of Railroad Commissioners of the State of California, "Annual report of the Board of Railroad Commission of the State of California for the Year Ending November 1, 1891, Volume 12," 80.

convinced to build the underpasses in San Mateo to show its good will towards the city's officials and residents and to display the railroad's modern, stable, and up-to-date character. Following construction of these underpasses, this area just north of downtown San Mateo grew quickly with houses filling in the ever decreasing number of vacant lots on either side of the tracks.[17]

In addition to the development of San Mateo, the East Poplar Avenue bridge and other San Mateo underpasses are also associated with the wider development of grade separations in the early twentieth century along the San Francisco Peninsula and elsewhere in California. These San Mateo structures are among the earliest grade separations in the state and as such are precursors to later grade separations built as motor vehicle usage increased along the peninsula, and throughout the state, between the 1910s and 1930s. Although automobiles had begun to appear in San Mateo by 1903, it is unlikely that Southern Pacific installed these underpasses specifically for automobile use, but they became useful to that end. As stated, the underpasses provided greater access for residents on both sides of the track, and relative to the sheer size of the railroad berm, the underpasses prevented the need for long or very steep approaches that would have been built for at-grade crossings. During the first few decades of the twentieth century, particularly along the San Francisco Peninsula, automobile and motor vehicle use increased dramatically. At the same time, railroad traffic intensified and the accident rates at railroad grade crossings grew quickly. Along with concern for the deaths and injuries at railroad crossings, the business community found there to be negative economic consequences for delays caused by at-grade crossings. State officials and concerned civic leaders promoted grade separations as the means to improve public safety and improve local economics. There was a drive to build many underpasses and overpasses, particularly in the 1920s and 1930s, and many were built essentially following the successful model of the underpasses at San Mateo. The enormous costs associated with construction of such structures led to disputes between the state, local municipalities, and railroads over the apportionment of the costs, but public funding helped many get built.[18] The four San Mateo underpasses are the earliest grade separations along the former Southern Pacific Coast Line between San Francisco and Gilroy, and they are among a

[17] Construction of these underpasses also coincided with the President Theodore Roosevelt's campaign visit to Burlingame in May 1903. He arrived by train. While this, nor the United Railway Company competition, can be directly linked to the construction of the San Mateo railroad bridges, these events may have influenced their construction or their schedule for completion.

[18] Alan Hynding, *From Frontier to Suburb*, 35, 70, 92, 95, and 112; Stanger, *South from San Francisco: The Life Story of San Mateo County*,), 146; Alexander and Hamm, *History of San Mateo County*, (Burlingame, CA, 1916), 53 and 103-104; L. Wickert, Historic Resources Inventory form on San Mateo Railroad Avenue railroad bridges, July 1989; and Southern Pacific Railroad Company, "San Mateo" Station Plat, November 1907.

small group of such structures within entire state. In a 1950 article regarding the history of bridges in California, California Division of Highways highway engineer F.W. Panhorst presented an unnamed 1902 Southern Pacific underpass in Atascadero (likely at Capistrano Avenue) as one of the state's earliest grade separations. This assertion corresponds with dates of construction culled from Caltrans bridge logs, which also show that very few early twentieth century (pre-1910) underpasses still exist in California particularly in the San Francisco Bay Area.[19]

The design of the San Mateo underpasses, and the materials Southern Pacific used to build them, indicate the railroad's efforts to modernize their bridges away from timber to durable and long lasting steel. Their design with steel plate girders, steel supports, steel stringers, and concrete abutments became common for grade separations along the peninsula and across the state. Later examples of unadorned through plate girder underpasses on concrete abutments along this rail line include the Madrone Underpass along old US Highway 101 (now State Route 82) in southern Santa Clara County, designed by the California Division of Highways and built in 1933, and the Army Street underpass in San Francisco and the Lafayette Street underpass in Santa Clara, both constructed in 1936. While the San Mateo structures may have not directly affected the design of later structures, the success that Southern Pacific had with such structures influenced later bridge building. From the early to mid-twentieth century, Southern Pacific built many steel through plate underpasses, and bridge engineers improved and altered the design of such underpasses to improve performance and safety qualities. The Army Street underpass in San Francisco, for example, was originally built in 1907 with a very similar design to these structures in San Mateo. As Army Street's motor vehicle traffic load increased, its steel supports on either side of the roadway became hazardous, and the city and Southern Pacific rebuilt the underpass with concrete supports. This type of underpass design continued to be used after World War II, for example, at Evans Avenue in San Francisco in 1964 and across Interstate 280 in San Jose in 1969, although reinforced concrete bridges became increasingly standard from the 1930s onward.[20]

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[19] F.W. Panhorst, "Century of Bridge Progress," *California Highways and Public Works*, September / October 1950, 123 and 130. See local agency and state highway bridge logs for San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, and San Luis Obispo counties at Caltrans website: http://www.dot.ca.gov/hq/structur/strmaint/.

[20] JRP Historical Consulting Services, "Inventory and Evaluation of Historic Resources Caltrain Electrification Project, San Francisco to Gilroy (MP 0.0 to 77.4)," prepared for Parsons Transportation Group, 2001.

The through plate girder railroad bridges in San Mateo are a structural type that were commonly built for railroads at the time and while not technically bold from an engineering standpoint, the four bridges in San Mateo, including the East Poplar Avenue structure, are illustrative of an important early phase of development within the evolution of underpass design. Their design was a precursor to later grade separation underpasses built as motor vehicle usage increased along the peninsula during the first half of the twentieth century. These early railroad structures are now a rare example of early grade separations in the San Francisco Bay Area.

III. SOURCES

Published Sources

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The above plans are on file at the Peninsula Corridor Joint Powers Board (PCJPB) headquarters at 1250 San Carlos Ave, San Carlos, California 94070.

Supplemental Information

1. Location and Project Vicinity maps are from Appendix A of "Finding of Adverse Effect: Caltrain San Mateo Bridges Replacement Project, Caltrain MP 17.20, 17.24, 17.45, and 17.53, In the City of San Mateo, San Mateo County, California," (2006).

2. A photographic view of the East Poplar Avenue Bridge is available at the California State Railroad Museum Library, 111 I Street, Sacramento, California 95814.

IV. PROJECT INFORMATION

This Historic American Engineering Record report was prepared to fulfill, in part, requirements of the Memorandum of Agreement (MOA) between the Federal Transit Administration and the California State Historic Preservation Officer, signed in April 2009, for the proposed project to demolish and replace the four railroad bridges including the East Poplar Avenue Underpass. The Federal Transit Administration, California State Historic Preservation Officer, and Peninsula Corridor Joint Powers Board (PCJPB) were signatories on the MOA. Partner / Architectural historian Christopher McMorris of JRP Historical Consulting, LLC and Research Assistant Chandra Miller prepared this document for the PCJPB. Mr. McMorris conducted the field inspection in April 2010. William B. Dewey prepared the photographic images for the project.

The narrative text in this report is based on JRP Historical Consulting Services reports entitled, "Inventory and Evaluation of Historic Resources Caltrain Electrification Project, San Francisco to Gilroy (MP 0.0 to 77.4)" (2001), JRP Historical Consulting, "Inventory and Evaluation of Historic Resources, Caltrain Five Bridges Project," (2006), and JRP Historical Consulting, "Finding of Adverse Effect: Caltrain San Mateo Bridges Replacement Project, Caltrain MP 17.20, 17.24, 17.45, and 17.53, In the City of San Mateo, San Mateo County, California," (2006). Research conducted for the 2001 and 2006 reports was undertaken at the California State Railroad Museum Library, California State Archives, California State Library, University of California Bancroft Special Collections, and the San Mateo County Historical Society.

LOCATION MAPS

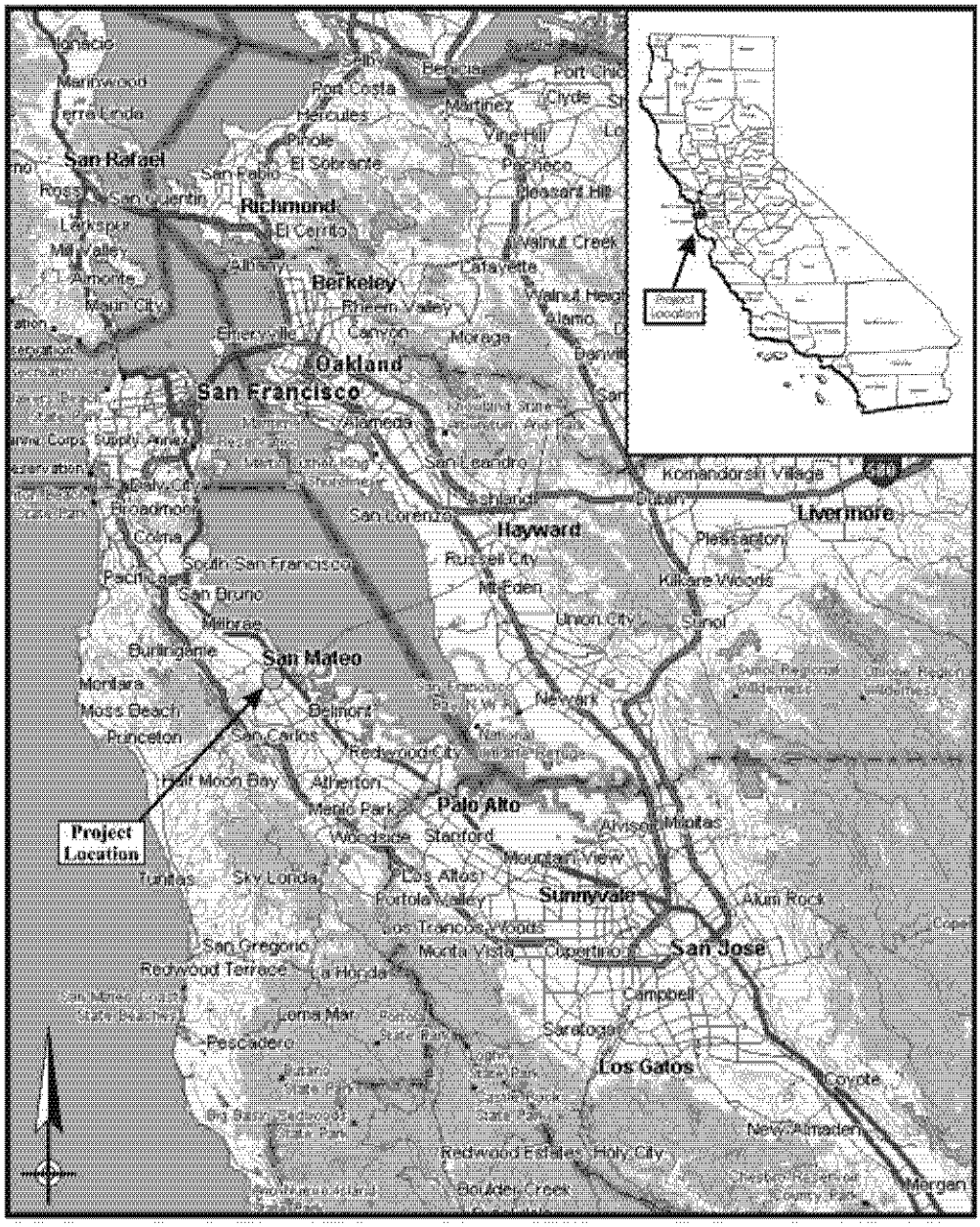

Figure 1: Location Map

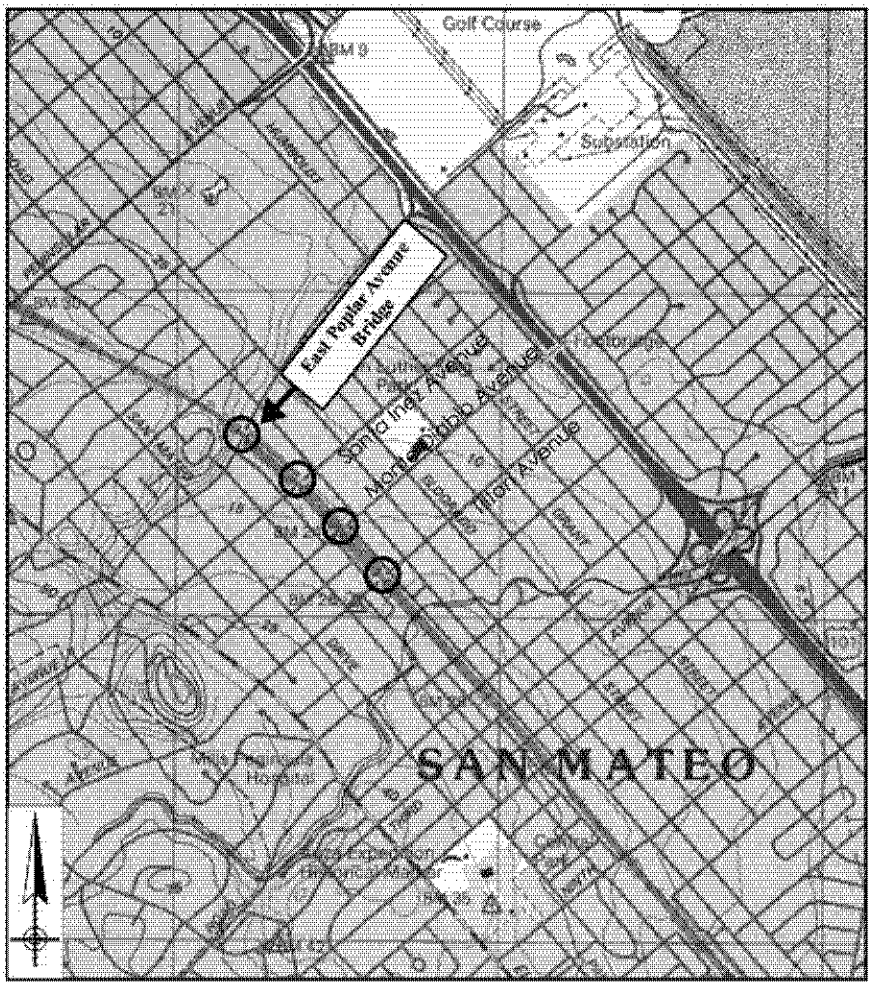

Figure 2. Project Vicinity
[Circles indicate location of the four San Mateo 1903 Underpasses]